

# Comparison of two methods to analyze humidity and ash

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## Introduction

Eurofins Cervac Sud is a quality control laboratory. It works for supermarkets who want to check that food complies with the legal regulations. The subject of this study is the determination of humidity and ash by two methods.

Improving analytical methods is crucial for laboratory development which is why the BIPEA organizes inter-laboratory tests. These tests are made on flour where the percentages of humidity and ash are known. This is in order to come closer to the reference values of the routine method.

To improve the humidity and ash methods, the ISO methodology is used for the comparison of two important parameters: the influence of the time the sample spends at 900°C, and the nature of the capsules.

## Experimental conditions

In the routine analysis, the humidity was determined by difference of mass of the quartz capsules before and after being placed for three hours in an oven at 130°C. These same capsules were burnt by putting them in an oven where the temperature rises gradually to 900°C. Once the temperature is reached, the samples remain in the oven for two hours.

For the ISO analysis method, the two analyses are different: for humidity, glass capsules, with a cover, are placed at 130°C during 90 minutes. While for ash, quartz capsules are placed in an oven for one hour at 900°C. The laboratory has aluminum, quartz and glass capsules, and the latter possess glass covers.

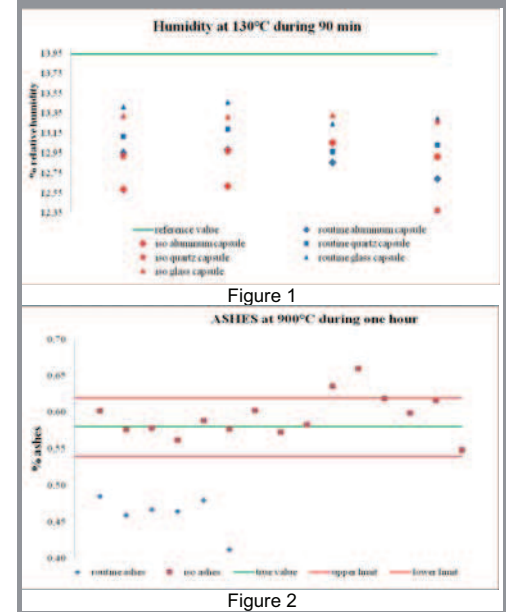
As temperature is very important; a ventilated oven is used, ensuring a homogeneous temperature. In order not to hydrate the product, the desiccant must be completely sealed and regularly regenerated. Quartz capsules are cleaned in an acid bath and placed at 900°C for 5 minutes. The same balance must be used during all the analyses.

## Results and discussion

As can be seen from figure 1, the percentage of relative humidity (%RH) of the flour using either quartz, aluminum or glass capsules is different. These tests were performed with open capsules and therefore the reference value cannot be achieved as flour loses its humidity over time, which explains why the contents are lower. The glass capsule with a lid is the most suitable method as with the cover, rehydration is limited. The study showed that to improve the determination of humidity, capsules with a lid should be used.

As we can see from figure 2, the ISO method is more effective than the routine one. The latter consists in burning the sample for two hours, and that underestimates the ash content. In fact, the reference value is reached when the ISO protocol, which leaves the capsule at 900°C for only one hour, is used. The ISO protocol gives results nearer to the reference value given by the BIPEA.

Fig 1: Influence of capsule's nature  
Fig 2: Influence of the procedure on the determination of ash



## Conclusion

To conclude, these new protocols allow a significant amount of time to be saved and thus allow the laboratory to improve its performance during the inter-laboratory tests. The results are consistent with the values provided by the agency BIPEA, therefore attesting to the quality of analysis performed within EUROFINs CERVAC.

Separating the two methods is not the best solution for the routine analysis, which is why a porcelain capsule with a lid should be tested and compared with the new method.



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